

In the Claims:

1-8. (Canceled)

9. (Currently Amended) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

wherein said Silicon Carbide substrate further includes a plurality of N Silicon Carbide layers;

wherein a first Silicon Carbide layer of said plurality of N ~~first~~ Silicon Carbide ~~layers~~ ~~layer~~ includes a bottom surface of said Silicon Carbide substrate;

wherein a last (Nth) Silicon Carbide layer of said plurality of N Silicon Carbide layers ~~said last N-th layer~~ includes a top surface of said Silicon Carbide substrate;

each ~~[[said]]~~ subsequent ~~[[k-th]]~~ layer overlying a ~~[[said]]~~ preceding ~~[[k-th]]~~ layer;

each ~~said k-th~~ Silicon Carbide layer other than the first Silicon Carbide layer having a ~~k-th~~ conductivity type selected from the group consisting of: {a first conductivity type; and a second conductivity type};

each ~~said k-th~~ Silicon Carbide layer other than the first Silicon Carbide layer having a ~~k-th~~ dopant concentration;

each said subsequent ~~k-th~~ Silicon Carbide layer being grown on said preceding ~~[[k-th]]~~ Silicon Carbide layer; ~~k is an integer greater than 1, k is an integer less or equal to N, N is an integer;~~

a bonding layer overlying said Silicon Carbide substrate; and

a single crystal Silicon semiconductor material having a top surface;

said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type},

said Silicon Carbide substrate having a first dopant concentration;

said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

10. (Currently Amended) The structure of claim 9, wherein at least one [[said k-th]] Silicon Carbide layer further comprises:

an epitaxially grown by a Chemical Vapor Deposition (CVD) process Silicon Carbide layer or an epitaxially grown by a molecular beam epitaxy (MBE) process Silicon Carbide layer.

11. (Currently Amended) A Silicon Carbide based Silicon structure comprising:
a Silicon Carbide substrate;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration;

~~said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration;~~

a bonding layer overlying said Silicon Carbide substrate; and

a single crystal Silicon semiconductor material having a top surface;

said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer, said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration;

wherein said single crystal Silicon semiconductor material further includes a plurality of M single crystal Silicon semiconductor material layers;

wherein a first of said plurality of M ~~said first~~ single crystal Silicon semiconductor material ~~layer~~ layers includes a bottom surface of said single crystal Silicon semiconductor material;

wherein a last of said plurality of M single crystal Silicon semiconductor material layers ~~said last M-th layer~~ includes a top surface of said single crystal Silicon semiconductor material;

each ~~said~~ subsequent ~~[[i-th]]~~ layer overlying a ~~said~~ preceding ~~(i-1)-th~~ layer;

each said ~~i-th~~ single crystal Silicon semiconductor material layer having an i-th conductivity type comprising said first conductivity type, or said second conductivity type;

each said ~~i-th~~ single crystal Silicon semiconductor material layer having an i-th dopant concentration;

each said subsequent ~~i-th~~ single crystal Silicon semiconductor material layer being grown on said preceding ~~(i-1)-th~~ single crystal Silicon semiconductor material layer; ~~i is an integer greater than 1, i is an integer less or equal to M, M is an integer.~~

12. (Currently Amended) The structure of claim 11, wherein at least one ~~said i-th~~ single crystal Silicon semiconductor material layer further comprises:

an epitaxially grown by a Chemical Vapor Deposition (CVD) process single crystal Silicon semiconductor material layer, or an epitaxially grown by a molecular beam epitaxy (MBE) process single crystal Silicon semiconductor material layer.

13. (Canceled)

14. (Currently Amended) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate; wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration;

~~said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration;~~

a bonding layer overlying said Silicon Carbide substrate; ~~wherein said bonding layer further comprises:~~

a Silicon layer; and

a single crystal Silicon semiconductor material having a top surface;

said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration;
said single crystal Silicon semiconductor material overlaying said bonding layer;
said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer.

15. (Previously Presented) A Silicon Carbide based Silicon structure comprising:
a Silicon Carbide substrate;
a bonding layer overlying said Silicon Carbide substrate; wherein said bonding layer further comprises:
a carbon layer;
and
a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;
wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

16. (Canceled)

17. (Previously Presented) A Silicon Carbide based Silicon structure comprising:
a Silicon Carbide substrate;
a bonding layer overlying said Silicon Carbide substrate; wherein said bonding layer further comprises:
a metal silicided layer selected from the group consisting of: {a tungsten silicide layer; a titanium silicide layer; and a cobalt silicide layer};

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type, and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

18. (Previously Presented) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a bonding layer overlying said Silicon Carbide substrate;

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said bonding layer;

and

at least one separation plug formed in said Silicon semiconductor material; said separation plug extending from said top surface of said Silicon semiconductor material into said Silicon Carbide substrate at a separation plug depth level, wherein said separation plug is configured to block the coupling between at least two adjacent active/passive structures, wherein each said active/passive structure is formed in said Silicon semiconductor material, said first active/passive structure extending from said top surface of said Silicon semiconductor material into said Silicon semiconductor material at a first active/passive structure depth level, said second active/passive structure extending from said top surface of said Silicon semiconductor material into said Silicon semiconductor material at a second active/passive structure depth level;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type,

and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

19. (Original) The structure of claim 18, wherein said separation plug further includes:

a trench filled with a material selected from the group consisting of:

an oxide material, polySilicon material, a metal material, a silicided material, a tungsten silicide material, a titanium silicide material, a cobalt silicide material, and a platinum silicide material.

20-31. (Canceled)

32. (Previously Presented) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material being grown on said Silicon Carbide substrate;

and

at least one separation plug formed in said single crystal Silicon semiconductor material; said separation plug extending from said top surface of said single crystal Silicon semiconductor material into said Silicon Carbide substrate at a separation plug depth level, wherein said separation plug is configured to block the coupling between at least two adjacent active/passive structures, wherein each said active/passive structure is formed in said single crystal Silicon semiconductor material, said first active/passive structure extending from said top surface of said single crystal Silicon semiconductor material into said single crystal Silicon semiconductor material at a first active/passive structure depth level, said second active/passive structure extending from said top surface of said single crystal Silicon semiconductor material into said single crystal Silicon semiconductor material at a second active/passive structure depth level;

wherein said Silicon Carbide substrate is of a conductivity type selected from the group consisting of: {a first conductivity type, and a second conductivity type}, said Silicon Carbide substrate having a first dopant concentration; said single crystal Silicon semiconductor material being of a conductivity type selected from the group consisting of: {said first conductivity type,

and said second conductivity type}, said single crystal Silicon semiconductor material having a second dopant concentration.

33. (Original) The structure of claim 32, wherein said separation plug further includes:

a trench filled with a material selected from the group consisting of:

an oxide material, a polySilicon material, a metal material, a silicided material, a tungsten silicide material, a titanium silicide material, a cobalt silicide material, and a platinum silicide material.

34-41. (Canceled)

42. (Currently Amended) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface;

said single crystal Silicon semiconductor material overlaying said double bonding layer;

said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

wherein said Silicon Carbide substrate further includes a plurality of N Silicon Carbide layers;

wherein ~~a said~~ first Silicon Carbide layer includes a bottom surface of said Silicon Carbide substrate;

wherein ~~a said~~ last N-th layer includes a top surface of said Silicon Carbide substrate;

each ~~said~~ subsequent k-th layer overlying ~~a said~~ preceding (k-1)-th layer;

each said k-th Silicon Carbide layer having a k-th conductivity type comprising ~~a said~~ first conductivity type, or ~~a said~~ second conductivity type;

each said k-th Silicon Carbide layer having a k-th dopant concentration;

each said subsequent k-th Silicon Carbide layer being grown on said preceding (k-1)-th Silicon Carbide layer;

wherein k is an integer greater than 1, k is an integer less or equal to N, N is an integer.

43. (Currently Amended) The structure of claim 42, wherein at least one ~~said k-th~~ Silicon Carbide layer further comprises:

an epitaxially grown by a Chemical Vapor Deposition (CVD) process Silicon Carbide layer or an epitaxially grown by a molecular beam epitaxy (MBE) process Silicon Carbide layer.

44. (Currently Amended) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate; and

a single crystal Silicon semiconductor material having a top surface;

said single crystal Silicon semiconductor material overlaying said double bonding layer;

said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

wherein said single crystal Silicon semiconductor material further includes a plurality of M single crystal Silicon semiconductor material layers;

wherein a ~~said~~ first single crystal Silicon semiconductor material layer includes a bottom surface of said single crystal Silicon semiconductor material;

wherein a ~~said~~ last M-th layer includes a top surface of said single crystal Silicon semiconductor material;

each ~~said~~ subsequent i-th layer overlying a ~~said~~ preceding (i-1)-th layer;

each said i-th single crystal Silicon semiconductor material layer having an i-th conductivity type comprising a ~~said~~ first conductivity type, or a ~~said~~ second conductivity type;

each said i-th single crystal Silicon semiconductor material layer having an i-th dopant concentration;

each said subsequent i-th single crystal Silicon semiconductor material layer being grown on said preceding (i-1)-th single crystal Silicon semiconductor material layer;

wherein i is an integer greater than 1, i is an integer less or equal to M, M is an integer.

45. (Currently Amended) The structure of claim 44, wherein at least one ~~said~~ ~~with~~ single crystal Silicon semiconductor material layer further comprises:

an epitaxially grown by a Chemical Vapor Deposition (CVD) process single crystal Silicon semiconductor material layer, or an epitaxially grown by a molecular beam epitaxy (MBE) process single crystal Silicon semiconductor material layer.

46. (Previously Presented) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

wherein said double bonding layer further comprises:

a Silicon dioxide layer;

and

a Silicon germanium (SiGe) layer;

wherein said Silicon Carbide substrate is attached to said Silicon dioxide layer; and wherein said single crystal Silicon semiconductor material is attached to said Silicon germanium (SiGe) layer.

47. (Previously Presented) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

wherein said double bonding layer further comprises:

a carbon layer;

and

a Silicon germanium (SiGe) layer;

wherein said Silicon Carbide substrate is attached to said carbon layer; and wherein said single crystal Silicon semiconductor material is attached to said Silicon germanium (SiGe) layer.

48. (Previously Presented) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

wherein said double bonding layer further comprises:

a metal silicided layer;

and

a Silicon germanium (SiGe) layer;

wherein said Silicon Carbide substrate is attached to said metal silicided layer;

and wherein said single crystal Silicon semiconductor material is attached to said Silicon germanium (SiGe) layer;

and wherein said metal silicided layer is selected from the group consisting of: a tungsten silicide layer; a titanium silicide layer; and a cobalt silicide layer.

49. (Previously Presented) A Silicon Carbide based Silicon structure comprising:

a Silicon Carbide substrate;

a double bonding layer overlying said Silicon Carbide substrate;

and

a single crystal Silicon semiconductor material having a top surface; said single crystal Silicon semiconductor material overlaying said double bonding layer; said single crystal Silicon semiconductor material bonded to said Silicon Carbide substrate via said double bonding layer;

further including:

at least one separation plug formed in said single crystal Silicon semiconductor material;

said separation plug extending from said top surface of said single crystal Silicon semiconductor material into said Silicon Carbide substrate at a separation plug depth level, wherein said separation plug is configured to block the coupling between at least two adjacent active/passive structures, wherein each said active/passive structure is formed in said single crystal Silicon semiconductor material, said first active/passive structure extending from said top surface of said single crystal Silicon semiconductor material into said single crystal Silicon semiconductor material at a first active/passive structure depth level, said second active/passive structure extending from said top surface of said single crystal Silicon semiconductor material into said single crystal Silicon semiconductor material at a second active/passive structure depth level.

50. (Original) The structure of claim 49, wherein said separation plug further includes:
a trench filled with a material selected from the group consisting of:
an oxide material, polySilicon material, a metal material, a silicided material, a tungsten silicide material, a titanium silicide material, a cobalt silicide material, and a platinum silicide material.